

Cardiac CT in 2026

Matthew J. Budoff, MD, FACC

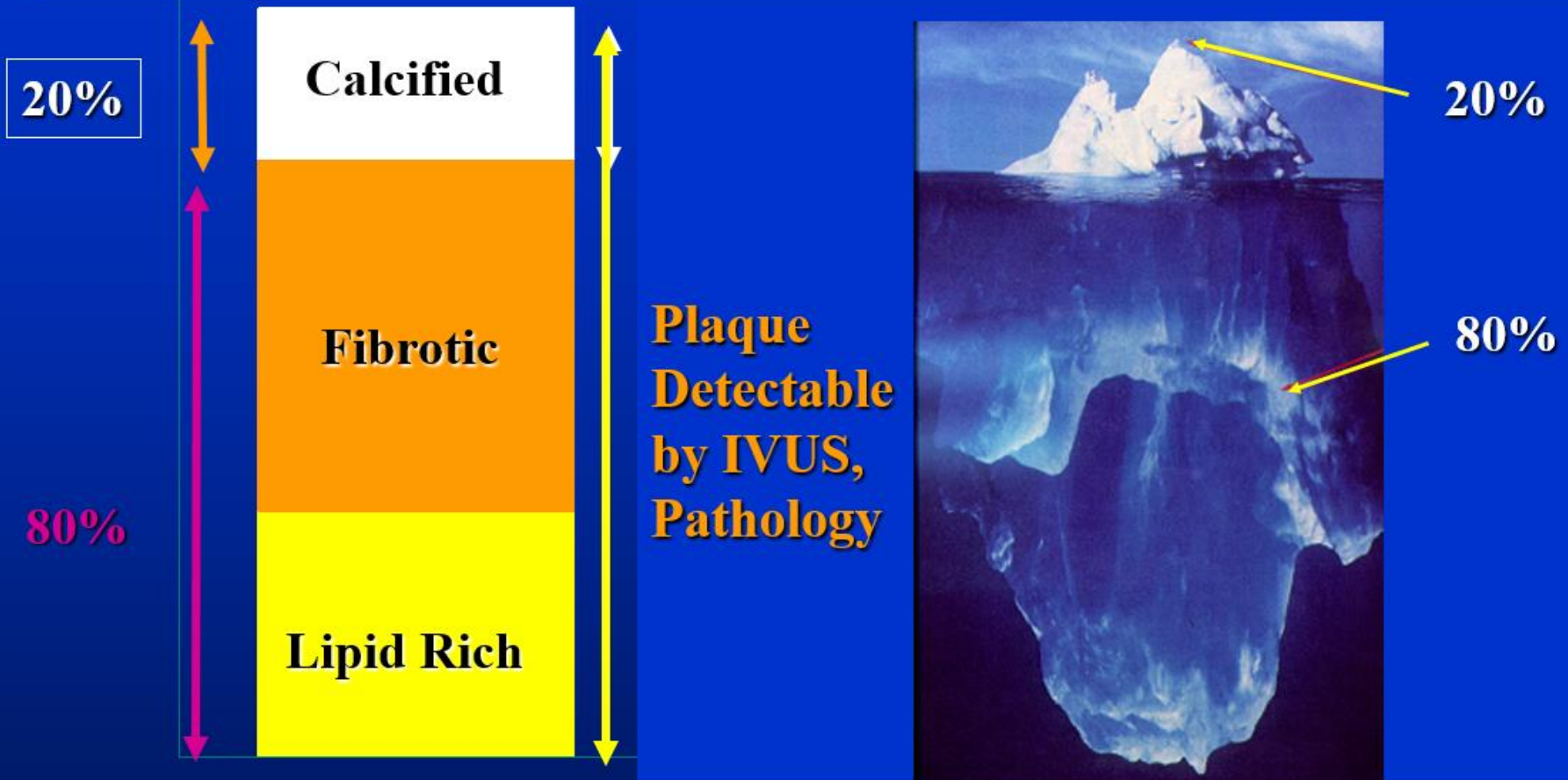
Professor of Medicine

Division of Cardiology

Harbor-UCLA Medical Center, Torrance CA

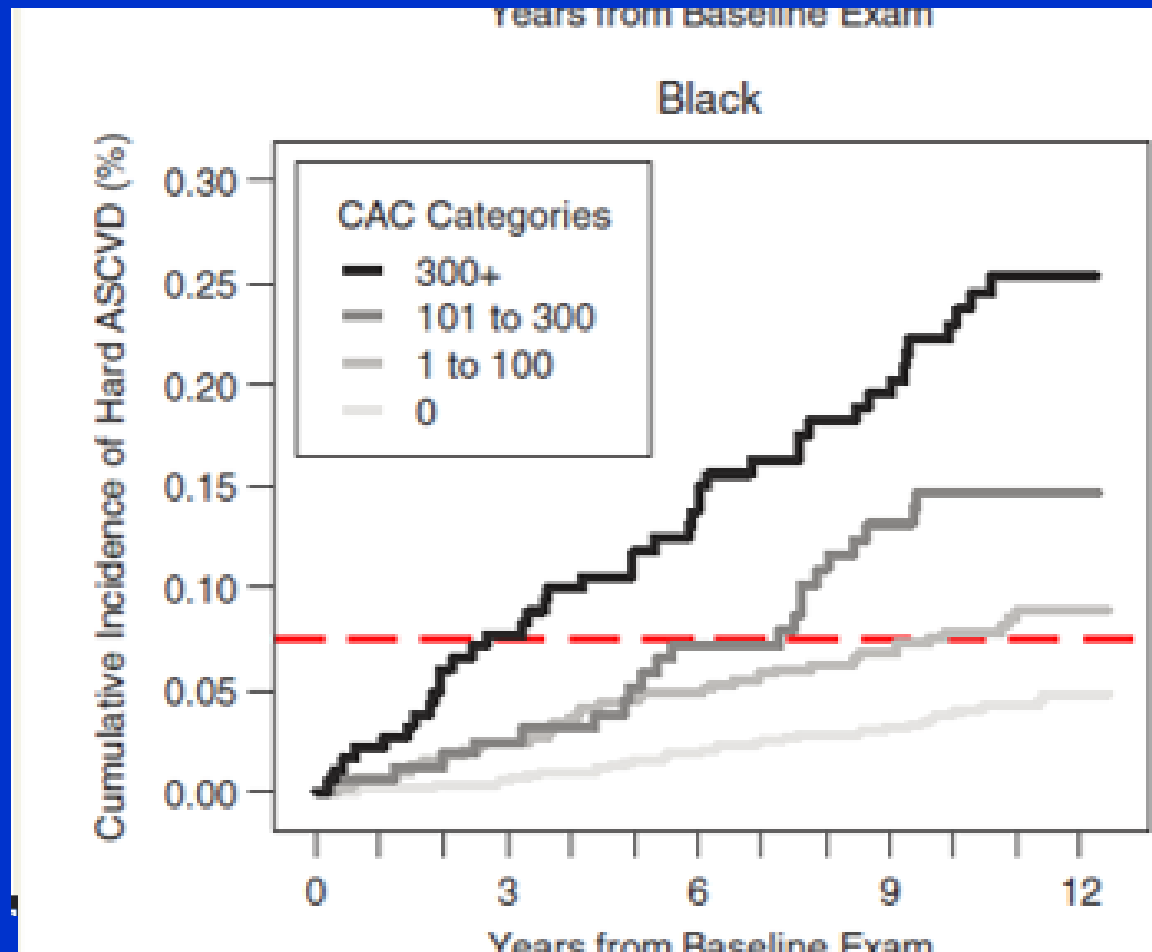
Conflict of Interest: Speakers Bureau Arineta

Total Coronary Artery Plaque and Coronary Calcium

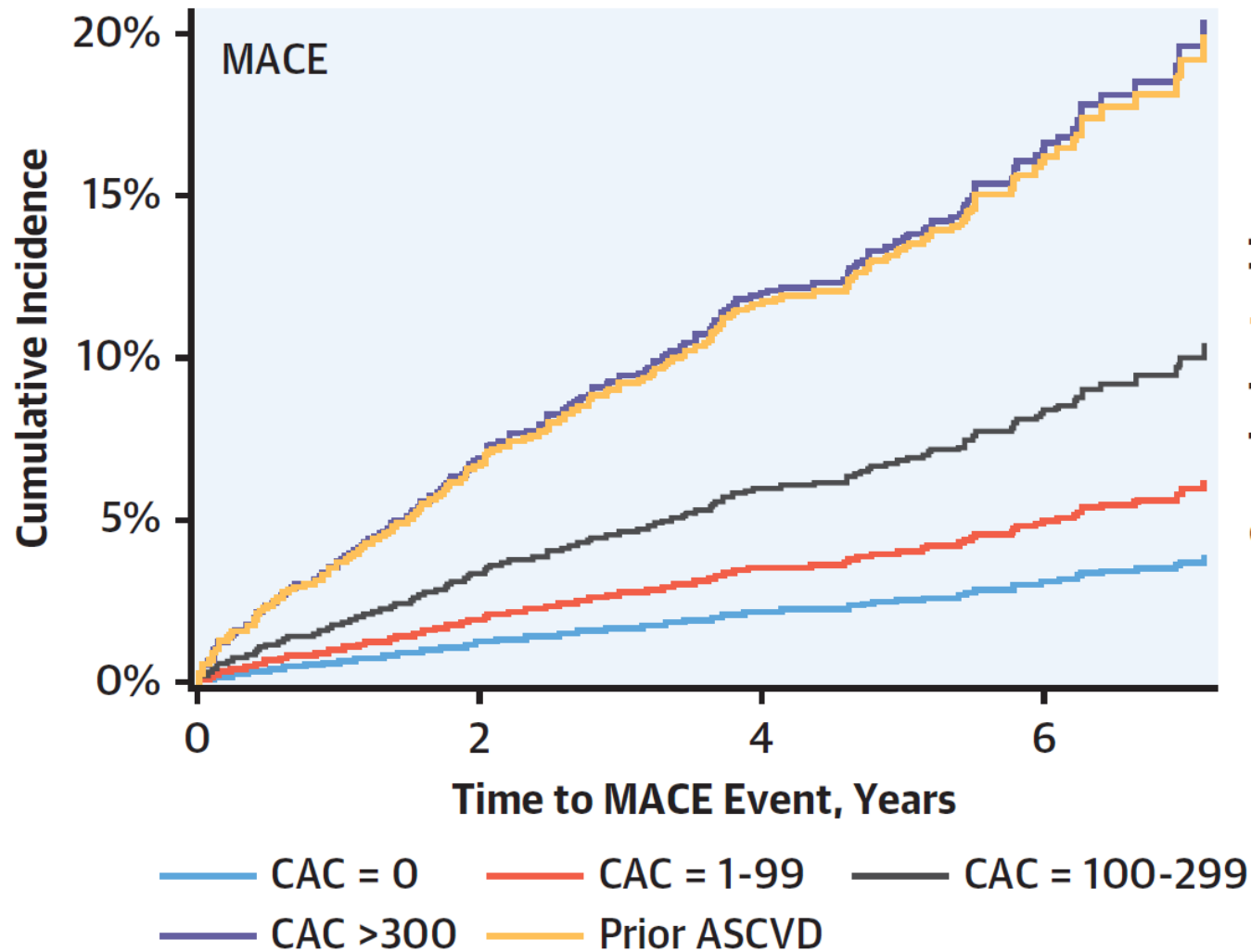


MESA STUDY 10 year outcomes

Budoff EHJ 2018



WHEN IS CAC SECONDARY PREVENTION





American
Heart
Association.

Presidential Advisory

AHA PRESIDENTIAL ADVISORY

Cardiovascular-Kidney-Metabolic Health:
A Presidential Advisory From the American
Heart Association

Chief SE Narasimhan MD, BSC, FAHA, Chair; Joseph B. Boushey MD, FAHA, Vice Chair; Sheryl L. Chertow MD, FAHA, Vice Chair; David S. Finkelstein MD, FAHA, Vice Chair

Stage 3: Subclinical CVD

Subclinical Atherosclerosis

CAC > 0

- Favors statin use in intermediate risk

CAC > 100

- Favors aspirin use if low bleeding risk
- Favors considering other agents for ASCVD risk reduction (eg, PCSK9i, GLP-1RA, icosapent ethyl) based on cardiovascular-kidney-metabolic profile

Subclinical Heart Failure

- EF < 40% → ACEi/ARB
β-blocker
- In diabetes → **SGLT2i**[†]

CVD Risk Equivalents for Stage 3:

- Very high-risk CKD*
- High predicted CVD risk per risk calculator

Ndumele CE, et al. *Circulation*.
2023;148(20):1606-1635

2026 ACC/AHA/AACVPR/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Dyslipidemia: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

7. CAC scoring in men at least 40 years of age and women at least 45 years of age can improve risk assessment and guide LDL-C and non-HDL-C goals. Both the absolute amount of CAC and the corresponding standardized percentile (currently based on age, sex, and race) have prognostic importance and help to reclassify risk in adults.

2026 Dyslipidemia Guidelines: The New Standard of Care

Pivotal shifts in the 2026 ACC/AHA Guidelines retiring 2018 recommendations, introducing modernized risk equations, emphasizing novel biomarkers like Lp(a) and ApoB, and re-establishing absolute treatment goals.



MODERNIZED RISK ASSESSMENT

The PREVENT-ASCVD Shift



PCE
(2018)



PREVENT-ASCVD
(2026)

Replaces older Pooled Cohort Equations with accurate, contemporary 10- and 30-year risk estimation.

The "CPR" Clinical Framework



C: Calculate
10-year risk

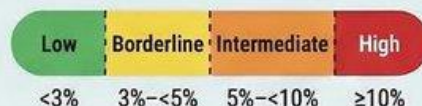


P: Personalize
with risk enhancers



R: Reclassify
using Coronary Artery Calcium (CAC)

New Risk Thresholds



10-YEAR RISK ESTIMATE CROSSWALK

	PCE (2018)	PREVENT-ASCVD (2026)
Low	<5%	<3%
Borderline	5%-<7.5%	3%-<5%
Intermediate	7.5%-<20%	5%-<10%
High	≥20%	≥10%

PRECISION MARKERS & TARGETS



Universal Lp(a) Screening

Measurement of Lipoprotein(a) recommended at least once for all adults.



The Return of Absolute Targets

<55% mg/dL

Very high-risk secondary prevention

<70% mg/dL

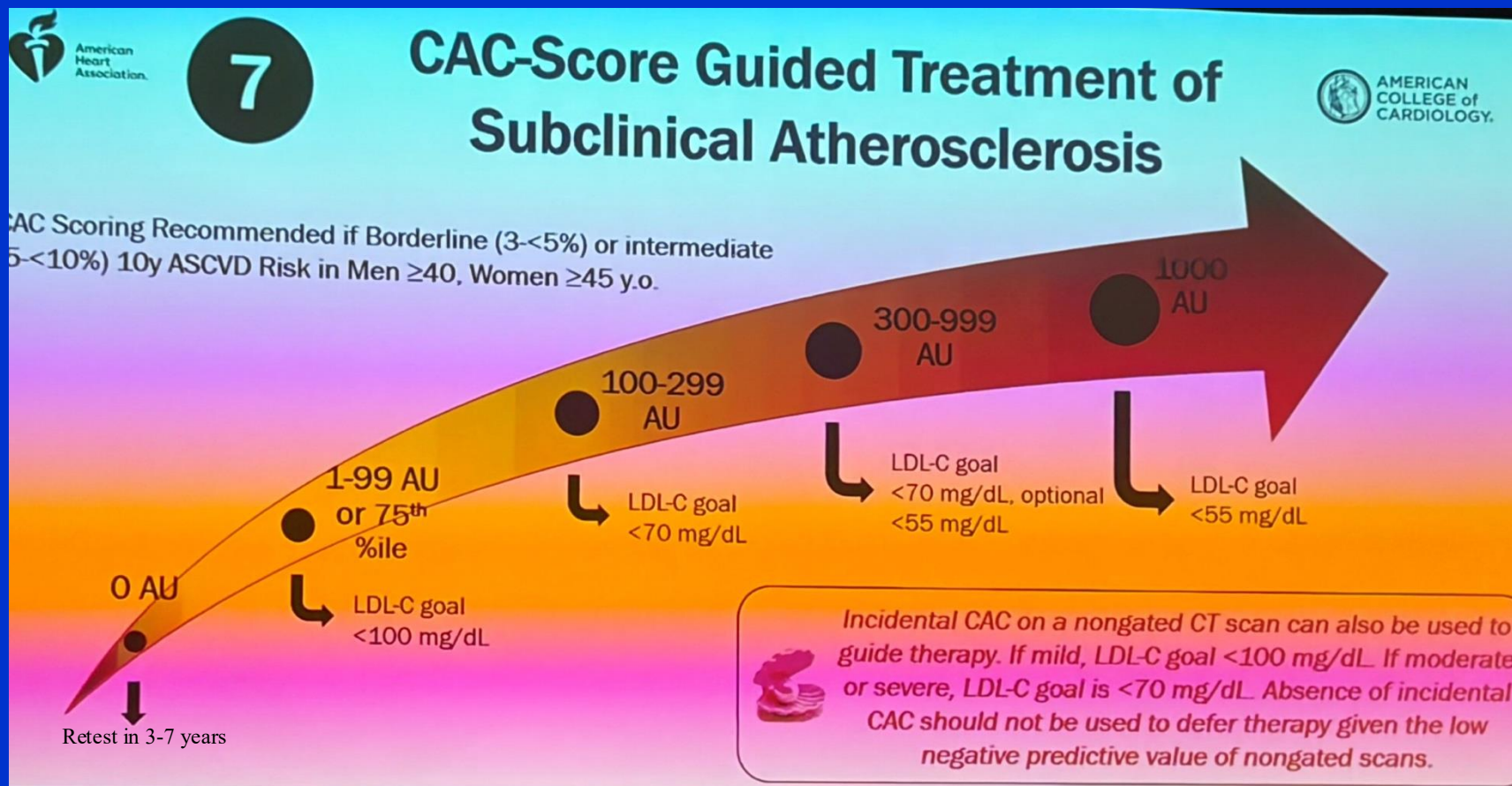
High-risk primary



ApoB as a Tie-Breaker

Use ApoB to guide therapy intensification when LDL-C is at goal but residual risk remains.

ACC AHA 2026 Cholesterol Guidelines



METHODS - CTA

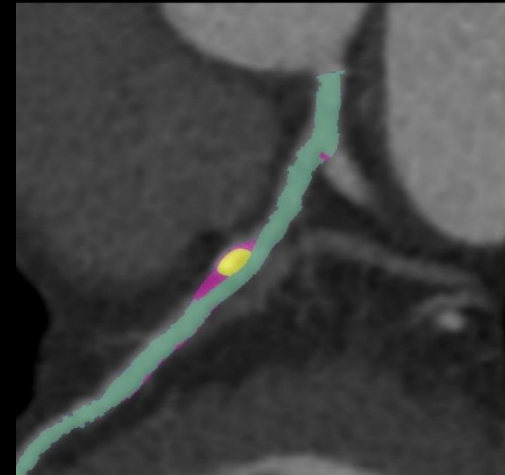
- 0.5-0.625 mm slices
- Single Breath-hold Imaging
- 50-60 cc Non-ionic (IODINATED) contrast
- 20 minute procedure
- 15 minute interpretation

Radiation Dose with CT

- Calcium scan – 0.5-0.6 mSv
- Mammography – 0.7 mSv
- 64 Slice CT Angiogram – 9 mSv
- ARINETA 256 CT Angiography – 1-3 mSv
- Background Radiation 3 mSv/year
- Coronary Angiogram – Average 8 mSv (2-10)
- Nuclear Imaging – 9-41 mSv

Cardiac exam 0.6 mSv

HR: 69bpm, Cardiac Phase: 75%



* Obtained using a chest factor of
0.014*DLP

EVINCI STUDY
Circ 2015

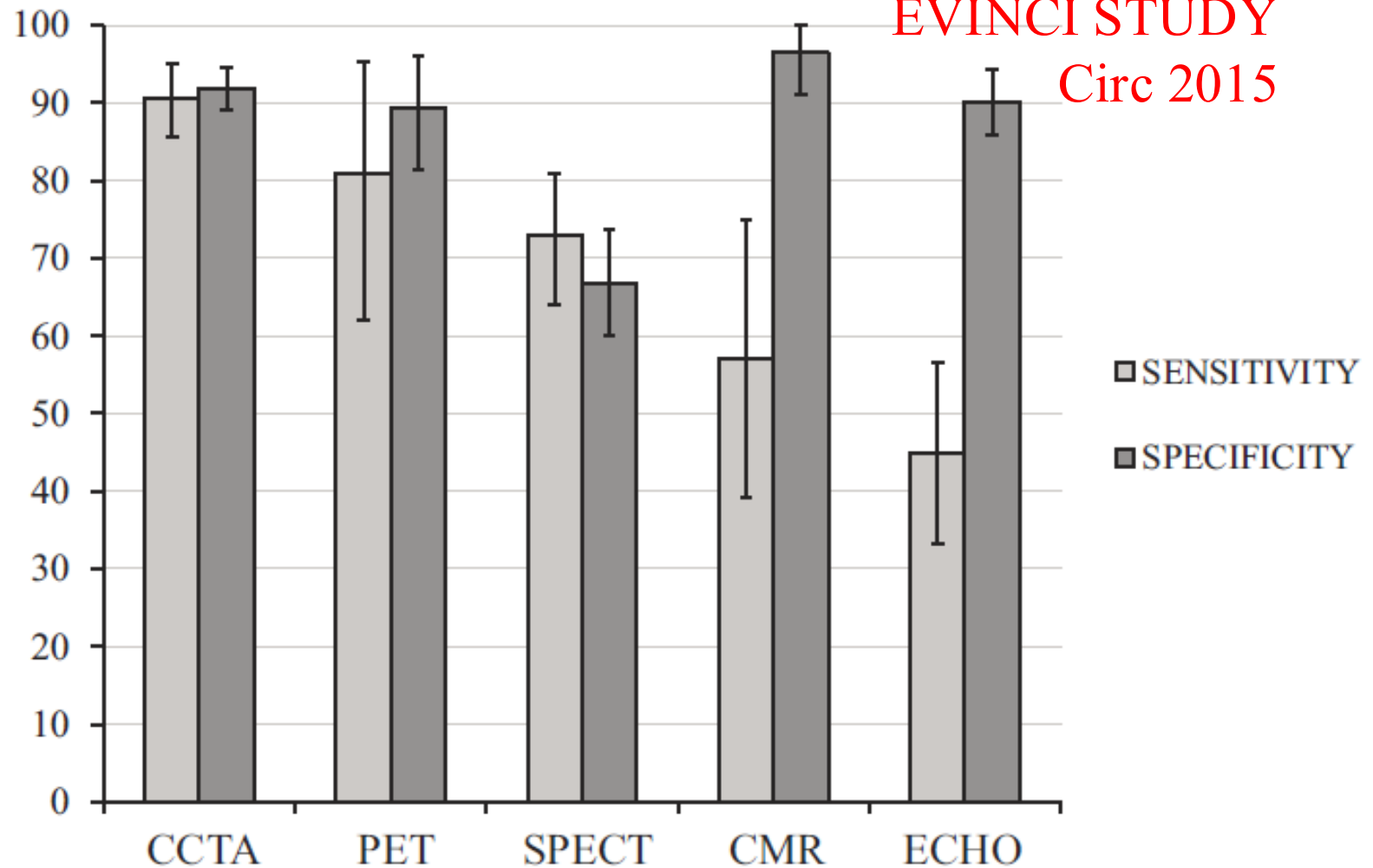


Figure 3. Sensitivity and specificity of noninvasive imaging techniques.

CCTA indicates coronary computed tomography angiography; CMR, cardiac magnetic resonance; ECHO, echocardiography; PET, positron emission tomography; and SPECT, single-photon computed emission tomography.

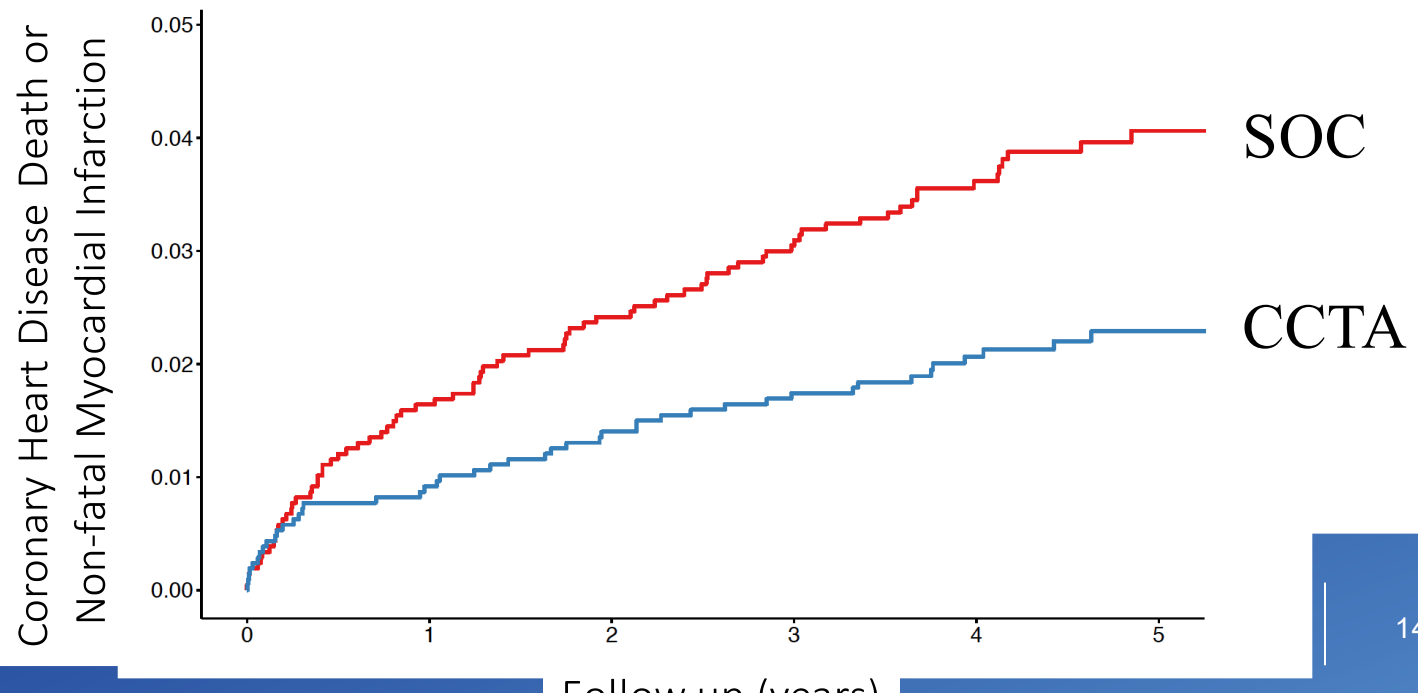
Coronary CT Angiography and 5-Year Risk of Myocardial Infarction

The SCOT-HEART Investigators*

Newby et al, NEJM 2018

SCOT-HEART 5-Year Analysis: cCTA-first pathway improves outcomes

- 4,146 patients across the UK randomized between cCTA or standard care
- Early data showed impact of using cCTA for diagnosis, treatment, etc.
- Key findings:
 - A. 41% lower death & MI rate in cCTA group than in standard care group at 5 years





2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain

Endorsed by the American Society of Echocardiography, American College of Chest Physicians, Society for Academic Emergency Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance

Intermediate-High Risk Patients With Stable Chest Pain and No Known CAD

Recommendations for Intermediate-High Risk Patients With Stable Chest Pain and No Known CAD

Referenced studies that support the recommendations are summarized in Online Data Supplements 29 and 30.

Index Diagnostic Testing: Selecting the Appropriate Test

COR	LOE	Recommendations
Anatomic Testing		
1	A	1. For intermediate-high risk patients with stable chest pain and no known CAD, <u>CCTA is effective for diagnosis of CAD, for risk stratification, and for guiding treatment decisions.</u>

Intermediate-Risk Patients With Acute Chest Pain and No Known CAD (con't.)

Stress Testing		
1	B-NR	4. For intermediate-risk patients with acute chest pain and no known CAD who are eligible for cardiac testing, either exercise ECG, stress echocardiography, stress PET/SPECT MPI, or stress CMR is useful for the diagnosis of myocardial ischemia.



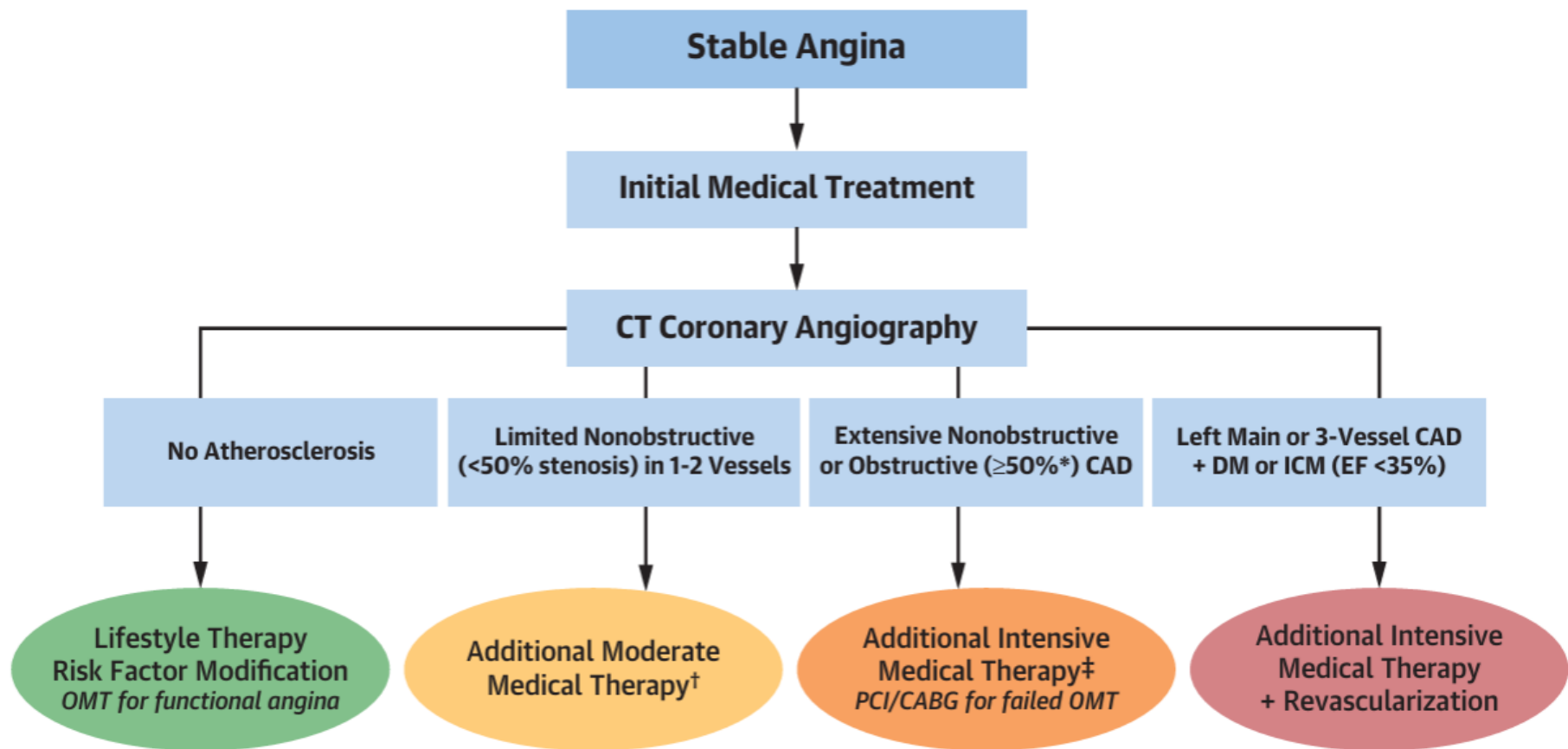
ASNC



2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain

Endorsed by the American Society of Echocardiography, American College of Chest Physicians, Society for Academic Emergency Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance

CENTRAL ILLUSTRATION Contemporary Evaluation and Management of Stable Angina



Ferraro, R. et al. J Am Coll Cardiol. 2020;76(19):2252-66.

A proposed testing and management algorithm for patients with angina. Staging of coronary artery disease modified after Arbab-Zadeh and Fuster (29).

*Denotes stenosis assessment by quantified analysis (corresponding to approximately 70% by visual evaluation) (29). †For example, single antiplatelet therapy, single-agent lipid-lowering therapy. ‡For example, intensified antithrombotic and/or lipid-lowering therapy, anti-inflammatory treatment.

CABG = coronary artery bypass grafting; CAD = coronary artery disease; DM = diabetes mellitus; EF = ejection fraction; PCI = percutaneous coronary intervention.

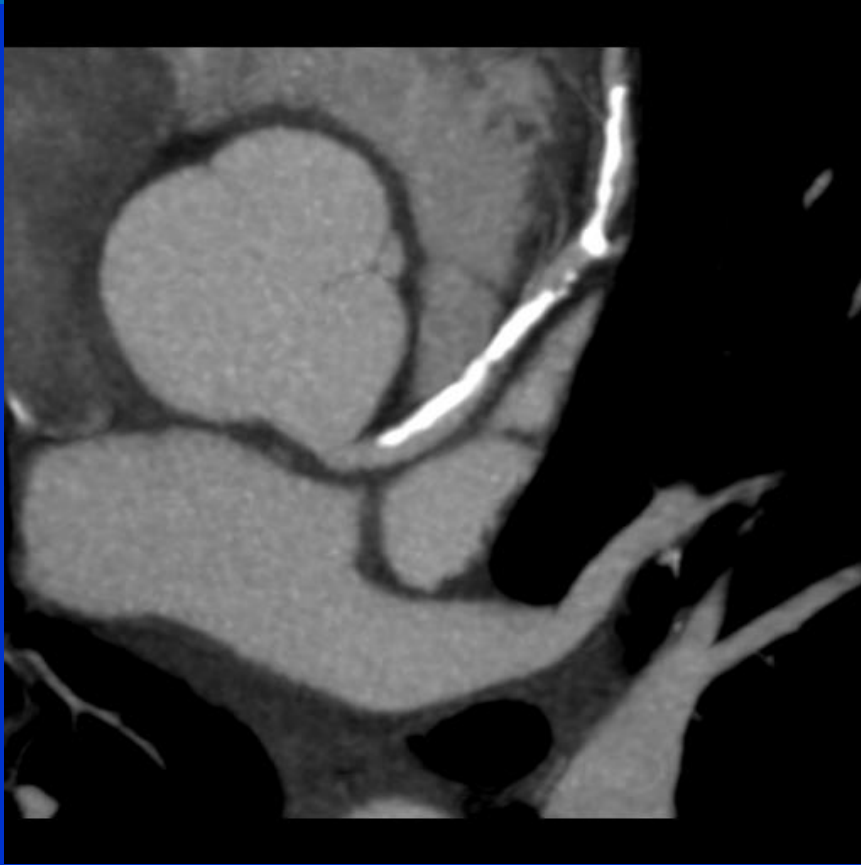
“State of the ART” Coronary CTA

- Identify of normal patients – 99% NPV
- Identify patients in need of preventative medical treatment (statin and ASA)
- Efficient triage for reduced down stream testing
- Useful for prognosis and assessment of plaque and ischemia (FFRCT/Plaque AI)
- Excellent for patients with low to intermediate risk of ACS
- Endorsed by Peer Reviewed International Standards Groups and Insurance carriers, ESC and AHA/ACC

Don'ts with Cardiac CT

- Don't Scan patients with dense calcification
- Multiple or Small diameter Stents
- High Heart Rates
- High Pre-Test Probability of CAD
- Renal Insufficiency/Severe Contrast Allergy

Or with CTA
We can do better!!



**FUNCTIONAL
TEST RESULT =
NORMAL STUDY,
Reassure patient**

**CT ANGIOGRAM =
Severe Atherosclerosis,
INSTITUTE STATIN,
ASPIRIN
LIFESTYLE....**

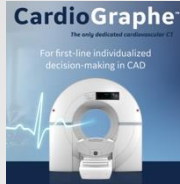


RURAL

Risk Underlying Rural Areas Longitudinal Study



Why we chose CardioGraphe for RURAL



The world's first and only dedicated cardiovascular CT:

QUALITY – High quality images for any patient

SPEED – The world's fastest CT scanner

COVERAGE – Whole heart imaging in a **single heartbeat**

ACCESS – Easily located in physician office, cath lab, mobile

SMALL – Small footprint for lower installation cost,
Lower power needs, lighter weight

DEDICATED – Easy to train and operate

COST – Top performance at lower price



Conclusions

"All truth passes through three stages.

First, it is ridiculed.

Second, it is violently opposed.

Third, it is accepted as
being self-evident."

-Arthur Schopenhauer

budoff@ucla.edu